



## Forensic Research + Analysis

March 10, 2024

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RE: *Michael Lately et al. v Silical Inc. et al., Case No: 3:22-CV-1134, United States District Court Northern District of Ohio Western Division*

Date of Crash: June 27, 2020

Date of Birth: *Michael Lately*: December 20, 1955 [65 years old at time of crash]

Dear Ms. Murray,

I am in receipt of your correspondence regarding the above-named action. I have reviewed the documentation accompanying your correspondence including medical records, information regarding the subject crash, litigation documents, and other materials. The purpose of this report is to provide a description and analysis of the relative contribution of the actions of Mr. Lately and Mr. Ferrell (the driver of the semi tractor-trailer) in causing the subject collision, and Mr. Lately's associated serious spine, head, and other injuries.

*My qualifications to provide opinions concerning the matters herein, particularly on issues of the causal relationship between trauma and injury, are as follows:*

I am Professor and Chair of Forensic and Legal Medicine with the Faculty of Forensic and Legal Medicine of the Royal College of Physicians (UK), and a consultant in the fields of forensic medicine and forensic epidemiology. I am credentialed as a Fellow of the Royal College of Pathologists (UK), Fellow of the Faculty of Forensic and Legal Medicine (FFLM) of the Royal College of Physicians (UK) and member of the British Association in Forensic Medicine. I hold the following relevant academic degrees and certifications: a Doctor of Medicine degree (Med.Dr.) from Umeå University, a Doctor of Philosophy (Ph.D.) in public health/epidemiology from Oregon State University, a Master of Public Health (MPH) in epidemiology and biostatistics, also from Oregon State University, a master's degree in forensic medical sciences (MScFMS) with the Academy of Forensic Medical Sciences in the United Kingdom, *i.a.* In addition to my degreed

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education, I have completed a 2-year post-doctoral fellowship in forensic pathology at Umeå University in Sweden and hold a Diploma of Legal Medicine (DLM) with the FFLM. I am also a fellow of both the American Academy of Forensic Sciences and the American College of Epidemiology. I am a Fulbright Fellow and held a 3-year roster appointment (2017-20) with the United States Department of State as a Fulbright Specialist in the field of forensic medicine. I serve as tenured Associate Professor of Forensic Medicine at Maastricht University and a joint Clinical Professor of Psychiatry and Public Health and Preventative Medicine at Oregon Health and Science University School of Medicine, where I have taught courses for the past 24 years in forensic medicine, forensic epidemiology, and injury epidemiology. From 2005-2017 I held an appointment as an Adjunct Professor of Forensic Medicine and Epidemiology at the Institute of Forensic Medicine, Faculty of Health Sciences, Aarhus University, Aarhus, Denmark, and am a recent (2020-21) visiting professor at University of Indonesia in the Faculty of Medicine.

I have been a crash reconstructionist since 1996 and have had ACTAR accreditation (the Accreditation Commission on Traffic Accident Reconstruction) since 2005. Over the past >25 years I have participated in the reconstruction of more than 3,000 crashes, including more than 300 fatalities. From 1999 through 2007 I served as a vehicular homicide investigator for law enforcement (consultant to the state medical examiner and special deputy sheriff), and I am a former affiliate medical examiner with the Allegheny County Medical Examiner's office.

I am a member of the American Society of Biomechanics and have more than 60 scientific publications pertaining to injury biomechanics, including a book for the Society of Automotive Engineering and taught injury biomechanics in a faculty peer-reviewed course at OHSU for 15 years. I have served as a consultant on injury biomechanics to state and federal government.

I am an associate editor of the Journal of Forensic and Legal Medicine and serve or have served as an associate editor or editorial board member of 14 additional scientific peer-reviewed journals. I have published approximately 230 scientific papers, abstracts, book chapters and books on topics that include traffic crash injuries, crash reconstruction, injury causation and injury biomechanics, including the text for Elsevier, Forensic Epidemiology: Principles and Practice (2016). My publications have been cited by other authors more than 4,700 times.

I have provided testimony in more than 400 civil and criminal trials in state and Federal courts throughout the United States, Canada, and Australia. Please see my CV for further details.

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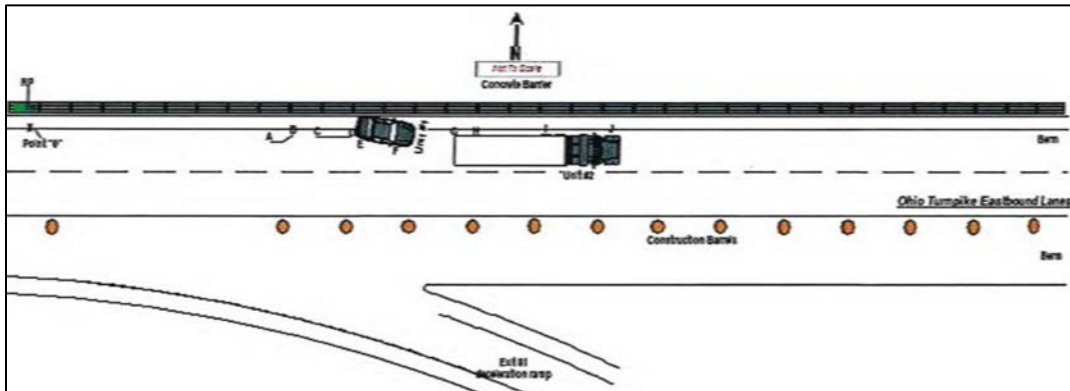
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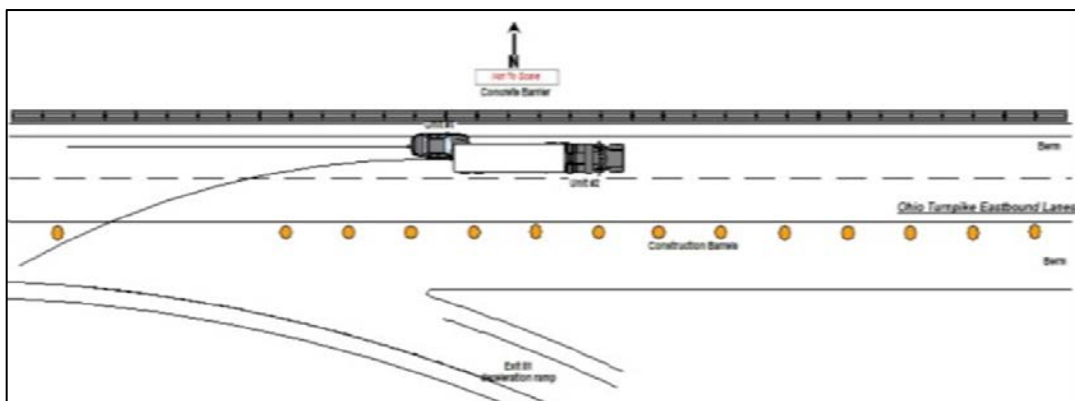
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**Background Facts:**

On June 27, 2020 at about 11:41 pm Michael Lately was the restrained driver of a 2014 Chrysler 300 4-door sedan that was eastbound on I-80 (Ohio Turnpike) near exit 81, Harris Township, Ohio when it struck the rear of a 2008 Stoughton commercial trailer being pulled by a 2015 Volvo 760 Series tractor driven by Patrick Ferrell. Mr. Ferrell had stopped his tractor-trailer in between barrels on the right side in a construction zone, and then reentered the right lane of travel, and then moved into the left lane while traveling at around 15 mph. Mr. Lately was traveling at a high rate of speed prior to the collision. Mr. Lately's toxicology screening at the hospital after the crash showed a blood alcohol content (BAC) of 0.161% and the presence of a cannabinoid. The images below depict two police diagrams and the subject vehicles post-collision:



**Police diagram (Mr. Lately's vehicle labeled "Unit #1")**



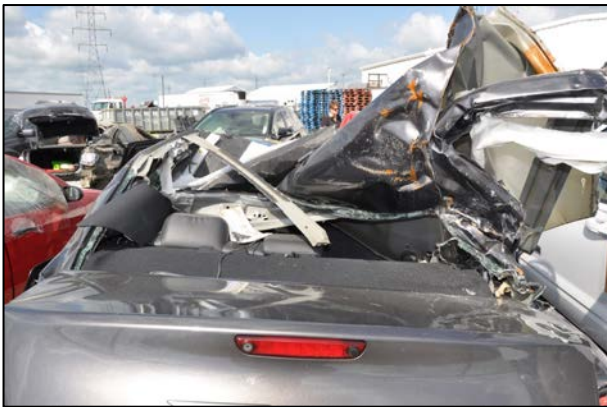
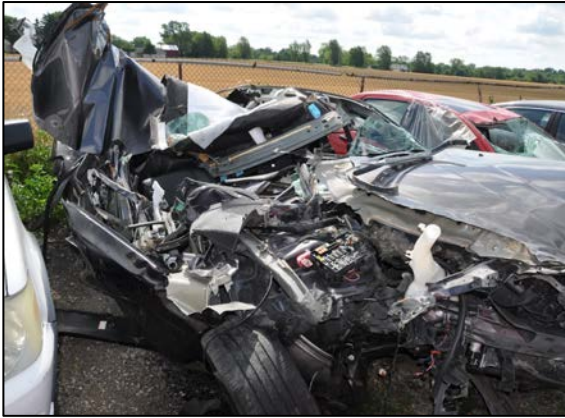
**Police diagram with pre-crash paths of travel for both vehicles**

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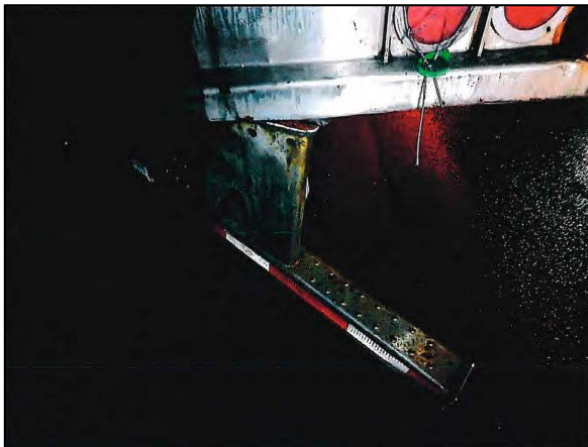
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**Mr. Lately's Chrysler, post-collision**





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**Stoughton Commercial Trailer, post-collision**



**Scene, post-collision**

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Based on the photos and description of the damage in the police report there was no part of the Chrysler that wasn't severely damaged during the high speed underride collision with the trailer. The primary damage was above the hood along with frontal damage. The frontal airbags in the vehicle deployed.

No damage estimate was reviewed for the Volvo tractor or Stoughton trailer. The only photos provided were taken at the scene, in the dark (see the previous pages). Based on the police report there was significant damage to the rear of the trailer. There was damage to the ICC (underride) bar, left rear door, left body panel, and rear axle.

After the crash, Mr. Lately recalled drifting in and out of consciousness, and remembered that he was trying to communicate that he was injured and that both of his legs hurt and felt weak. The efforts to extricate Mr. Lately from the passenger side of the vehicle were prolonged. Once extricated, EMS placed a cervical collar on Mr. Lately, and found that his GCS score was 8 and he was unable to feel or move his legs but responded to painful stimuli. Both pupils were equal at 5 mm. Electrocardiography revealed sinus rhythm/sinus tachycardia. Mr. Lately demonstrated very diminished breath sounds on the left side of his chest and decreased breath sounds on the right side of his chest with shallow respirations. He was intubated at the scene and transported via EMS to the St. Vincent Medical Center ED.

On examination in the ED Mr. Lately was non-responsive to pain, had an absent gag reflex; he had sustained a 2 cm laceration on the anterior portion of his right eyebrow; and both pupils were pinpoint (with concerns for corneal abrasion on the left side of the left eye). Mr. Lately underwent a CT scan of the facial bones which revealed a right orbital floor blowout fracture, and an initial CT scan of the cervical spine revealed congenital narrowing of the spinal canal from C3 through 7 without evidence of acute osseous abnormality; anterior spondylosis in the mid and lower cervical spine, multilevel disk protrusions left para-centrally at C3-4 and 4-5. CT scans of the chest abdomen, pelvis, thoracic and lumbar spine were also negative for acute osseous abnormality (with evidence of multiple ballistic fragments in and about the left hip-refer to prior history, and a sub-centimeter lucent focus within the left anterior inferior aspect of the T4 vertebral body). Mr. Lately also underwent a CT scan of the head which was negative for acute intracranial hemorrhage. Toxicology screening revealed a blood alcohol level of 0.161 and the presence of cannabinoids. Mr. Lately was diagnosed with an eyebrow laceration, orbital wall fracture, acute

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respiratory failure, and blood alcohol level of 120-199mg/100 ml. He was transferred to the surgical ICU for further management.

**On June 29, 2020, Mr. Lately underwent an emergent C3-5 cervical decompression and fusion.** He was extubated post-operatively. [Mr. Lately's first memory recall was waking up after the surgery].

Post-surgery he developed cervical myelopathy and spastic quadriparesis, worse in the left upper extremity and less in the bilateral lower extremities.

On July 14, 2020, Mr. Lately was admitted to the Cleveland Clinic Avon Rehabilitation Unit for complex rehabilitative therapy. He received treatment for range of motion, transfer training, endurance/balance, fall prevention, gait training, occupational therapy, and speech therapy.

On July 18, 2020, Mr. Lately presented to the Avon Hospital ED via EMS with chest pain, tightness, and shortness of breath. He was given aspirin and nitroglycerin en route; and in the ED underwent a CT scan of the chest which was negative for pulmonary embolism; electrocardiography (EKG) which demonstrated non-ischemia and further cardiac assessment which was negative for acute pathology. Although against medical advice, Mr. Lately was transported back to Avon Rehab via Midwest Ambulance in a stable condition.

Mr. Lately was released from the Cleveland Rehabilitation Clinic (Avon) on September 22, 2020, and transferred to the Twilight Gardens Nursing and Rehabilitation Center. His discharge diagnoses included the following: traumatic C4 incomplete quadriplegia status post C3-5 decompression and fusion; moderate diffuse traumatic brain injury; cognitive impairment; central cord syndrome; right orbital fracture; hypotension secondary to [spastic] quadriplegia, acute respiratory failure status post trach; dysphagia; depression, neurogenic bladder/bowel; anemia; orthostatic hypotension; tracheostomy complications; acute bilateral conjunctivitis; and depression.

On October 27, 2020, Mr. Lately was transferred to a skilled nursing facility for continued care.

On December 11, 2020, Mr. Lately underwent an assessment for home health care with Ohioans.

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On April 26, 2021, Mr. Lately presented to Dr. Christopher Hassett (neurology) with complaints of stiffness in his arms and spasms in his legs since the crash. Dr. Hassett diagnosed cervical myelopathy (leading to paresis in all four extremities and spasticity throughout). He recommended a consultation for Botox therapy and to follow up with neurosurgery.

On May 11, 2021, Mr. Lately presented to Dr. Nicole Danner (neurology) who recommended proceeding with Botox therapy.

On October 4, 2021, through May 31, 2022, Mr. Lately received continued Home Health Services. He was bedridden and required assistance with all activities of daily living. During this time Dr. Danner administered Botox injections on October 29, 2021, and January 28, 2022; and on April 20, 2022, Mr. Lately also underwent a wound care program to treat a sacral pressure ulcer.

On October 6, 2022, and January 5, 2023, Dr. Danner administered two further Botox injections.

On February 4, 2023, Mr. Lately presented to The Bellevue Hospital ED with complaints of generalized chest pain most increased over the left side over the past several weeks and with a sense of chest wall muscle restriction, worse with deep inspiration. Mr. Lately underwent an EKG which was negative for acute pathology, Troponin levels were negative. He was treated with Toradol and muscle relaxant medication, diagnosed with chest wall [musculoskeletal] pain and released home.

Mr. Lately's pre-crash history was non-contributory for any of his post-crash injuries. Around 20 years prior to the subject crash, Mr. Lately underwent surgery to remove bullet fragments from his left hip (leaving some residual fragments). Mr. Lately was fully independent with mobility and activities of daily living at the time of the crash.

*Medical and other records reviewed for history*

Michael Lately, deposition

The Bellevue Hospital ED

The Bellevue Hospital Rehabilitation Services

Twilight Gardens Nursing & Rehabilitation

Defiance Skilled Nursing Facility

Sandusky County EMS



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Advanced Neurological Associates (ANA)  
Cleveland Clinic Physical Medicine & Rehabilitation  
Cleveland Clinic Rehabilitation, Avon  
Mercy St. Vincent Medical Center ED  
Med1Care  
Avon Hospital ED  
Ohioans Home Health Care

### **Analysis**

#### *Reconstruction of the crash*

According to the police report it was raining moderately to heavy at the time of the crash and there was standing water on the roadway. The traffic was light to moderate. The crash occurred in a construction zone where one lane had been closed to traffic, with the center and left lanes both still open. The police report indicated Mr. Lately's Chrysler 300 initially struck the left rear corner of the trailer with enough force that it traveled forward under the trailer until it struck the rear axle of the trailer. The tractor-trailer had enough speed to continue forward after the impact, so the Chrysler was no longer under the trailer by the time the tractor-trailer came to a stop.

Michael Lately testified at deposition, on October 24, 2023, that it had been very dark, raining, and foggy at the time of the crash, but it hadn't caused any visibility restrictions for him. After entering the construction zone, he saw cones closing a lane to his right that shifted traffic to different lanes.

The last speed sign he remembered seeing, after entering the construction zone, showed 55 mph. He estimated he was traveling about 60 mph at the time of impact. When he was close, just moments before the impact, he saw the tractor-trailer pull out from the closed lane. He saw the side lights of the tractor and trailer, which were sideways across the lane and immediately started pumping his brakes and tried to swerve to the left to go around and avoid hitting the tractor-trailer. He was in the right lane and there was a concrete barrier to his left when he tried to swerve.

When he entered the construction zone, there were no vehicles in front of him and one car behind him.

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No deposition was provided for the driver of the Volvo semi tractor-trailer, Mr. Ferrell. In a written statement provided to police Mr. Ferrell stated he was reentering the highway, had seen nothing close in his side mirrors, only lights way off in his driver side mirror, when the rear of his trailer was hit. He estimated he was traveling at about 15 mph and the other vehicle was traveling at 100+ mph at the time of impact. His truck and trailer were straight and completely in the left lane of travel when the impact occurred. He estimated he had been in the lane less than two minutes and was gaining speed when impact occurred. He did not hear tires squealing from the other car braking prior to impact. He didn't feel the impact much but heard it.

He stated that he merged into the left lane because there was only one lane of travel; the rest was closed off with traffic barrels.

Chrysler ACM download:

The airbag control module (ACM) for the Chrysler was downloaded on July 27, 2020, by HRYCAY Consulting Engineers Inc. The ACM recorded two events (the second event is the most recent event) with the second one occurring about 0.3 seconds after the first. Both events show the same ignition cycles and odometer reading. The second (most recent) event shows a deployment event, but the longitudinal delta V is -0.6 mph (impact from the front) with a lateral delta V of 6.2 mph (impact from the left). Relative to the 1<sup>st</sup> prior event, this may be an impact with the median concrete barrier.

The first event is also a deployment event and shows the pre-crash data for the "1<sup>st</sup> Prior Event" (consistent with the initial impact) shows the Chrysler was traveling 97 mph five seconds prior to impact. The speed stayed 97 mph until about 2 seconds prior to impact. Then the accelerator pedal drops to zero about 2.3 seconds prior to impact with the brake activated about 1.8 seconds prior to impact. ABS activated about 1.1 seconds prior to impact. The last 0.5 seconds recorded prior to impact, steering input to the left increased from 7 degrees to 73 degrees.

The CDR report shows a maximum longitudinal delta V of 63.4 mph with a duration of 272 msec and a lateral delta V of 8.7 mph (shown below).

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System Status at Event (1st Prior Event)	
Complete File Recorded	Yes
Safety Belt Status, Driver	Buckled
Safety Belt Status, Outboard Front Passenger	Not Buckled
Airbag Warning Lamp, On/Off	Off
Seat Track Position Switch, Foremost, Status, Driver	No
Seat Track Position Switch, Foremost, Status, Outboard Front Passenger	Not Present
Maximum Delta-V Longitudinal (MPH km/h)	-63.4 (-102)
Time, Maximum Delta-V Longitudinal (msec)	272
Maximum Delta-V Lateral (MPH km/h)	8.7 (14)
Time, Maximum Delta-V Lateral (msec)	262
Time, Operation System Time (sec)	11269502
Time, Airbag Warning Lamp On (min)	0
Event Number	1
Total Number of Events Recorded	2
Multi-Event, Number of Events (1,2)	1
Time from Event 1 to 2 (sec)	> 6
Operation Via Energy Reserve Only (Yes, No)	No
Supply Voltage at Event, ECU (V)	14.2
Temperature, Outside (deg C)	22
Event Signal Transmission, Complete (Yes, No)	Yes
Odometer at Event (km)	146246.3
Ignition Cycle, Crash	11396
VIN, Original	2C3CCABG1EH356999
VIN Recorded at Event (last 8 characters)	EH356999
Deployment Command Data (1st Prior Event)	
Frontal Airbag Deployment, 1st Stage, Driver	Yes
Frontal Airbag Deployment, 2nd Stage, Driver	Yes
Frontal Airbag Deployment, Time to First Stage Deployment, Driver (msec)	211
Frontal Airbag Deployment, Time from TD to 2nd Stage Deployment, Driver (msec)	361
Frontal Airbag Deployment, 1st Stage, Passenger	Yes
Frontal Airbag Deployment, 2nd Stage, Passenger	Yes
Frontal Airbag Deployment, Time to First Stage Deployment, Passenger (msec)	211
Frontal Airbag Deployment, Time from TD to 2nd Stage Deployment, Passenger (msec)	251
Knee Airbag Deployment, Driver	Yes
Buckle Pretensioner, Driver	Yes
Retractor Pretensioner, Driver	Yes
Buckle Pretensioner, Passenger	Yes
Retractor Pretensioner, Passenger	Yes
Side Seat Airbag Deployment, Left	No
Side Curtain Airbag Deployment, Left	No
Side Seat Airbag Deployment, Right	No
Side Curtain Airbag Deployment, Right	No

Pre-Crash Data (1st Prior Event - table 1 of 4)									
(the most recent sampled values are recorded prior to the event)									
Time Stamp (sec)	Pre-Crash Recorder Status	Speed, Vehicle Indicated (MPH km/h)	Accelerator Pedal, % Full	Engine Throttle, % Full	Service Brake	Engine RPM	ABS Activity	Stability Control	Steering Input (deg)
-5.0	Complete	97 (156)	39	35	Off	2,573	No	On	-4
-4.9	Complete	97 (156)	39	35	Off	2,579	No	On	-4
-4.8	Complete	97 (156)	39	35	Off	2,584	No	On	-3
-4.7	Complete	97 (156)	39	35	Off	2,578	No	On	-3
-4.6	Complete	97 (156)	39	35	Off	2,590	No	On	-3
-4.5	Complete	97 (156)	39	35	Off	2,579	No	On	-4
-4.4	Complete	97 (156)	39	35	Off	2,582	No	On	-5
-4.3	Complete	97 (156)	39	35	Off	2,583	No	On	-6
-4.2	Complete	97 (156)	39	35	Off	2,583	No	On	-6
-4.1	Complete	97 (156)	39	35	Off	2,584	No	On	-6
-4.0	Complete	97 (156)	33	35	Off	2,587	No	On	-5
-3.9	Complete	97 (156)	29	30	Off	2,579	No	On	-4
-3.8	Complete	97 (156)	29	30	Off	2,579	No	On	-5
-3.7	Complete	97 (156)	32	31	Off	2,580	No	On	-7
-3.6	Complete	97 (156)	35	34	Off	2,589	No	On	-8
-3.5	Complete	97 (156)	35	36	Off	2,581	No	On	-8
-3.4	Complete	97 (156)	35	36	Off	2,584	No	On	-8
-3.3	Complete	97 (156)	34	36	Off	2,587	No	On	-6
-3.2	Complete	97 (156)	34	35	Off	2,581	No	On	-5
-3.1	Complete	97 (156)	33	35	Off	2,588	No	On	-4
-3.0	Complete	97 (156)	35	35	Off	2,589	No	On	-3
-2.9	Complete	97 (156)	35	35	Off	2,580	No	On	-3
-2.8	Complete	97 (156)	35	36	Off	2,580	No	On	-3
-2.7	Complete	97 (156)	36	36	Off	2,585	No	On	-3
-2.6	Complete	97 (156)	36	36	Off	2,592	No	On	-2
-2.5	Complete	97 (156)	35	36	Off	2,591	No	On	-2
-2.4	Complete	97 (156)	16	35	Off	2,578	No	On	-2
-2.3	Complete	97 (156)	0	15	Off	2,566	No	On	-2
-2.2	Complete	97 (156)	0	10	Off	2,562	No	On	-1
-2.1	Complete	97 (156)	0	5	Off	2,565	No	On	-1
-2.0	Complete	97 (156)	0	5	Off	2,564	No	On	0
-1.9	Complete	98 (156)	0	5	Off	2,555	No	On	0
-1.8	Complete	98 (156)	0	5	On	2,511	No	On	0
-1.7	Complete	98 (156)	0	5	On	2,429	No	On	0
-1.6	Complete	98 (156)	0	5	On	2,330	No	On	0
-1.5	Complete	95 (153)	0	4	On	2,208	No	On	0
-1.4	Complete	94 (152)	0	4	On	2,085	No	On	0
-1.3	Complete	93 (150)	0	4	On	1,953	No	On	-3
-1.2	Complete	92 (148)	0	4	On	1,924	No	On	-1
-1.1	Complete	91 (147)	0	4	On	1,897	Yes	On	-1
-1.0	Complete	90 (145)	0	4	On	1,897	Yes	On	-6
-0.9	Complete	89 (143)	0	4	On	1,877	Yes	On	-3
-0.8	Complete	87 (140)	0	4	On	1,830	Yes	On	6
-0.7	Complete	86 (138)	0	3	On	1,775	Yes	On	6
-0.6	Complete	86 (139)	0	3	On	1,814	Yes	On	6
-0.5	Complete	85 (137)	0	3	On	1,810	Yes	On	7
-0.4	Complete	83 (133)	0	3	On	1,867	Yes	On	17
-0.3	Complete	78 (125)	0	3	On	1,913	Yes	On	39
-0.2	Complete	78 (126)	0	3	On	1,958	Yes	On	56
-0.1	Complete	82 (132)	0	3	On	2,039	Yes	On	73

CDR data from Mr. Lately's Chrysler  
System data and pre-crash data for the Chrysler's initial impact

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Volvo tractor data download:

The Volvo tractor data was downloaded on July 24, 2020. Two acceleration related events were recorded that record a total of 90 seconds with a trigger event in that time frame (no data is provided in the report about what triggers the event, but I would assume it is a sudden increase or decrease in acceleration). The "Incident Date" is listed in both events as November 18, 2020, which is after the download date and inconsistent with crash date with no details are given about this date. General details about the events:

1. The first event occurs 60 seconds after recording starts and shows the Volvo traveling at a speed in the high 60's and begins slowing down about 40 seconds prior to the event to around 20 mph at the event. It continues in to travel below 20 mph for another 16 seconds before speeding up again. The first event recording ends 30 seconds after the event with the Volvo traveling 49 mph. This recording is not related to the subject collision.
2. The second event occurs 90 seconds after recording starts and shows the Volvo traveling between 70 and 57 for the first 30 seconds. The Volvo begins slowing for the next 15 seconds slowing to speeds below 20 mph. The next 45 seconds the Volvo is traveling below 20 mph until it stops at the 90 second mark with no evidence of a sudden acceleration event. This recording is also unrelated to the subject collision.

Discussion

The subject high speed collision was obviously a highly dangerous event. The primary question of forensic interest is how the actions of both drivers contributed to causing the crash. While Mr. Lately was both driving at high speed and intoxicated at the time of the crash, had Mr. Ferrell not stopped his vehicle in a construction zone at night, requiring him to re-enter traffic in an unsafe area, the collision would not have occurred, regardless of Mr. Lately's speed or degree of intoxication. Further adding to the danger of his re-entry onto the turnpike, shortly after re-entering the roadway and while traveling at approximately 15 mph, Mr. Ferrell made an unsafe lane change from the right (middle) lane into the far left lane, effectively blocking Mr. Lately's attempt to avoid the crash by changing lanes. Had Mr. Ferrell not made this second dangerous maneuver the collision would not have occurred, either. The CDR download from his Chrysler indicates that, despite his intoxication, Mr. Ferrell perceived and reacted to the semi in his lane.

Mr. Lately's high pre-impact speed was a major contributing factor to the crash, in that it would have made it more difficult for Mr. Ferrell to see his vehicle in his driver's side mirror as he entered the middle lane of the turnpike from between the construction barrels, versus if he was traveling

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at or near the speed limit. For every second from the time of the semi entering the roadway until the collision, the Chrysler vehicle would have been approximately 60-70 feet further away, in comparison with if Mr. Lately had been traveling at 50-60 mph prior to and as the semi entered the construction zone.

Because the subject crash was a rear impact car versus semi tractor-trailer underride collision, the nature of the collision ranks it as one of the most dangerous of all crash types, even those occurring at much lower speeds than the subject collision.<sup>1</sup> The primary danger is from the height of the trailing edge of the trailer, which presents a high risk of engagement with the A-pillars of average height passenger cars (far above their crush zones), resulting in the collapse of the roof toward the heads of the front seat occupants, and carrying a high risk of serious injury and death. Although the ICC (underride) bar on the trailer provides an improved degree of protection to passenger car occupants in a 100% overlap rear impact versus when no ICC bar is present, the offset orientation of the subject collision, which was between the right front of the Chrysler and the left rear of the trailer, largely negated this protective effect. Even if the subject collision had occurred at a substantially lower speed (*i.e.*, 40 mph closing) the serious spine and head injuries that Mr. Lately sustained would have still been highly likely because of the partial overlap (offset) orientation of the crash.

### **Conclusions**

While it is possible that Mr. Lately may have been able to avoid the collision or that he would have sustained less serious injuries had he been traveling at a lower speed, there is no reliable evidence to support such a supposition on a more probable than not basis, and this is primarily due to the highly dangerous last second maneuver that Mr. Ferrell made in moving from the middle to the left lane without checking for approaching traffic behind him.

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<sup>1</sup> Blower et al. Heavy-Vehicle Crash Data Collection and Analysis to Characterize Rear and Side Underride and Front Override in Fatal Truck Crashes 2013:DOT HS 811 725:



Florence Murray, Esquire  
Attorney at Law

RE: *Michael Lately et al. v Silical Inc. et al.*, Case No: 3:22-CV-1134, United States District  
Court Northern District of Ohio Western Division

March 10, 2024

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The preceding opinions were given as reasonable medical, and scientific probabilities. I reserve  
the right to amend any of my opinions should new information come to light.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Ma', with a long horizontal line extending to the left and a shorter one to the right.

Michael D. Freeman, MedDr, PhD, MScFMS, MPH, FRCPath, FFFLM, FACE, DLM

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CURRICULUM VITAE  
**MICHAEL D. FREEMAN**

October 2023

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**EDUCATION:**

*Doctor of Medicine (Med.Dr.)*

Faculty of Medicine, Umeå University, Umeå, Sweden

*Doctor of Philosophy (Ph.D.) Public Health/ Epidemiology*

Oregon State University, Corvallis, Oregon

*Master of Science in Forensic Medical Science (MScFMS)*

Academy of Forensic Medical Sciences, London, England

University of Verona, Verona, Italy

*Master of Public Health (MPH), Epidemiology/ Biostatistics*

Oregon State University, Corvallis, Oregon

*Doctor of Chiropractic (DC)*

University of Western States, Portland, Oregon

*Bachelor of Science (BS) General Science*

University of Oregon, Eugene, Oregon

**FORENSIC MEDICINE QUALIFICATIONS:**

*Fellow, Royal College of Pathologists (FRCPath)*

Royal College of Pathologists, London, United Kingdom, 2023 to present

*Fellow, Faculty of Forensic and Legal Medicine (FFFLM)*

Royal College of Physicians, London, United Kingdom, 2022 to present (FRCPath equivalent)

*Member, Faculty of Forensic and Legal Medicine (MFFLM)*

Royal College of Physicians, London, United Kingdom, 2021 to present (MRCP equivalent)

*Member, British Association in Forensic Medicine, (elected professional association for forensic pathologists in the United Kingdom and Ireland), 2022 to present*

*Diploma of Legal Medicine (DLM)*

Faculty of Forensic and Legal Medicine, Royal College of Physicians, London, United Kingdom, 2019

**FELLOWSHIPS:**

*Fulbright Specialist Roster*

Bureau of Educational and Cultural Affairs and World Learning,

United States Department of State, 2017-2020 tenure

*Postdoctoral Fellowship*

Forensic Pathology

Section of Forensic Medicine, Department of Community Medicine and Rehabilitation,  
Umeå University, Umeå, Sweden, 2014-2015

**ACADEMIC POSITIONS:**

*Regular Faculty Appointments*

Associate Professor of Forensic Medicine and Epidemiology – 2018 (permanent tenured appointment)

Department of Epidemiology

CAPHRI Research Institute for Public Health and Primary care

Faculty of Health, Medicine, and Life Sciences

Maastricht University Medical Centre+

Maastricht, The Netherlands

Associate Professor of Forensic Medicine – 2015 to 2018

Department of Cell Biology and Complex Genetics

CAPHRI Research Institute for Public Health and Primary care

Faculty of Health, Medicine, and Life Sciences

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Maastricht, The Netherlands

*Clinical and Affiliate Appointments*

Joint Clinical Professor, Psychiatry and Public Health & Preventive Medicine – 2016 to present

Department of Psychiatry

School of Medicine, Oregon Health & Science University

Portland, Oregon

Affiliate Professor of Epidemiology – 2010 to 2015

Department of Public Health and Preventive Medicine

School of Medicine, Oregon Health & Science University

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Affiliate Professor of Psychiatry – 2011 to present

Department of Psychiatry

School of Medicine, Oregon Health & Science University

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Clinical/Affiliate Associate Professor – 2005-10

Department of Public Health and Preventive Medicine

School of Medicine, Oregon Health & Science University

Portland, Oregon

Clinical Assistant Professor – 1997-2005

Department of Public Health and Preventive Medicine

School of Medicine, Oregon Health & Science University

Portland, Oregon

*Visiting Professorships*

Visiting Professor of Medical Science – August 2020-April 2021

Faculty of Medicine, University of Indonesia

Jakarta, Indonesia

*Adjunct Appointments*

Adjunct Professor of Forensic Epidemiology and Traumatology – 2012-17

Department of Forensic Medicine, Faculty of Health Sciences, Aarhus University

Aarhus, Denmark

Adjunct/Honorary Associate Professor of Epidemiology and Traumatology – 2012-17

Department of Forensic Medicine, Faculty of Health Sciences, Aarhus University

Aarhus, Denmark

Adjunct Associate Professor of Forensic Medicine and Epidemiology – 2005-12  
Institute of Forensic Medicine, Faculty of Health Sciences, Aarhus University  
Aarhus, Denmark

Adjunct Professor – 2015-16  
University of Western States  
Portland, Oregon

**EDITORIAL ACTIVITIES:**

Guest Editor: Special Issue on death in custody

*Journal of Forensic and Legal Medicine*, 2023

Lead Guest Editor, Special Issue on Forensic Epidemiology:

*International Journal of Environmental Research and Public Health*, 2020

Co-Editor in Chief:

*Journal of Whiplash-Related Disorders* 1999-2006

Associate Editor:

*Journal of Forensic and Legal Medicine*, 2022 to present

*BMC Musculoskeletal Disorders*, 2019-present

*The Spine Journal* 2007-present

*PM&R*, official scientific journal of the American Academy of Physical Medicine and Rehabilitation, 2008 to 2023

*Scandinavian Journal of Forensic Medicine*, 2012 to present

*J of Forensic Biomechanics*, 2010-present

*OA Epidemiology*, 2014

Editorial Board Member:

*Journal of Forensic and Legal Medicine*, 2022 to present

*International Journal of Environmental Research and Public Health*, 2019 to 2023

*Forensic Science International Reports*, 2019 to present

*Orthopedics*, 2019 to present

Top 10 Reviewer 2019, *Orthopedics*

*The Spine Journal*, 2004 to present

*International Research Journal of Medicine and Medical Sciences*, 2015

*Egyptian Journal of Forensic Sciences*, 2010 to present

*Journal of Case Reports in Practice* 2014 to present

*Austin Journal of Public Health & Epidemiology* 2014-2016

*Edorium Journal of Public Health*, 2014

Advisory Board Member:

*Challenges* 2020-present

Editorial Committee Member:

*Spine* 2004-2009

Peer reviewer:

*Safety and Health at Work (Elsevier)*

*Journal of Vascular and Interventional Radiology*

*BMC Musculoskeletal Disorders*

*BMC Public Health*

*BMC Research Notes*

*Annals of Epidemiology* (outstanding reviewer status 2015)

*Orthopedics*

*Spine*

*The Spine Journal*

*Lancet*

*Mayo Clinic Proceedings*

*Annals of Biomechanical Engineering*

*Journal of the American Board of Family Medicine*

*Journal of Forensic and Legal Medicine*

*Acta Neurologica Scandinavica*  
*Medical Science Monitor*  
*Pain Research & Management*  
*Journal of Back and Musculoskeletal Rehabilitation*  
*American Society for Testing and Materials (ASTM)*  
*Biosecurity & Bioterrorism*  
*Annals of Medical and Health Sciences Research*  
*Neurorehabilitation and Neural Repair*  
*International Research Journal of Medicine and Medical Sciences*  
*Jurimetrics*  
*Law, Probability, and Risk*  
*International Journal of Molecular Sciences*  
*Journal of Rehabilitation Medicine*  
*Arthritis*  
*BMC Pediatrics*  
*Journal of Back and Musculoskeletal Rehabilitation*  
*Diagnostic and Interventional Radiology*  
*Healthcare*  
*Expert Review of Medical Devices*  
*BMC Cancer*

**COURSES TAUGHT:**

PHPM 574 Forensic & Trauma Epidemiology  
Department of Public Health and Preventive Medicine  
Oregon Health & Science University School of Medicine  
Portland, Oregon 2006-2013

Principles of Forensic Medicine and Forensic Epidemiology  
Forensic Psychiatry Fellowship  
Department of Psychiatry  
Oregon Health & Science University School of Medicine  
Portland, Oregon – 2011 to present

PHPM 503 Thesis Advising  
Department of Public Health and Preventive Medicine  
Oregon Health & Science University School of Medicine  
Portland, Oregon 2005-present

PHPM 507 Injury and Trauma Epidemiology  
Department of Public Health and Preventive Medicine  
Oregon Health & Science University School of Medicine  
Portland, Oregon 1999 – 2005

Forensic Epidemiology and Bioterrorism  
Charles County Department of Public Health  
College of Southern Maryland, Waldorf, Maryland 2014

**ACTIVITIES and HONORS:**

Chair, Research subcommittee, Faculty of Forensic and Legal Medicine, London, UK, 2021-present  
Vice Chair, American Academy of Forensic Sciences Standards Board Medicolegal Death Investigation Consensus Body – 2016-2023  
Member, Academic committee, Faculty of Forensic and Legal Medicine, London, UK, 2021-present  
Member, Academic advisory board, Academy of Forensic Medical Sciences, UK. 2021-present.  
Member, Medicolegal Death Investigation subcommittee, Organization of Scientific Area Committees (OSAC) for Forensic Science, United States National Institute of Science and Technology (NIST), 2023-present  
Appointed member, Office of Chief Medical Examiner death in custody audit design team, Maryland Attorney General, Baltimore, MD, 2021-present.



Royal College of Pathologists, London, (UK)	
Fellow	2023 - present
Faculty of Forensic & Legal Medicine, Royal College of Physicians, London, UK	
Fellow	2022 - present
Member	2021 - 2022
Affiliate Member	2018 - 2021
American Academy of Forensic Sciences, Pathology/ Biology section	
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Academy of Forensic Medical Sciences, UK  
Fellow 2021-present  
American College of Epidemiology  
Fellow 2019 - present  
Member 2007 – 2019  
Royal Society for Public Health, UK  
Fellow 2022 - present  
Royal College of Physicians, London UK  
Associate member 2021 - present  
British Association in Forensic Medicine  
Member 2022 - present  
American Society of Biomechanics  
Member #6845 2023 - present  
Accreditation Commission on Traffic Accident Reconstruction (ACTAR)  
Accredited #1581 2005 - 2024  
Basic and Advanced Cardiac Life Support (BLS and ACLS) certified (exp. June 2024)  
Crash Data Retrieval Technician I & II  
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Diplomate, American Academy of Pain Management  
Member, Fulbright Association  
Member, American College of Epidemiology (2007-2019)  
Member, Association for the Advancement of Automotive Medicine  
Member, Sigma Xi Scientific Honor Society  
Member, Society of Automotive Engineers  
Past member, International Traffic Medicine Association  
Fellow, International College of Chiropractic  
Inactive member, North American Spine Society  
Past member, Forensic Accident Reconstructionists of Oregon

**GRANTS:**

2020-present Unrestricted grant, private donor. Evaluation of upper cervical CSF flow alterations in retired NFL players with chronic head injury. \$250,000.  
2017-2020 Fulbright scholarship, Fulbright Specialist program, Bureau of Educational and Cultural Affairs and World Learning, United States Department of State.  
2015 National Science Foundation Industry/University Cooperative Research Centers Program, NSF 13-594 Planning Grant: I/UCRC for Advanced Research in Forensic Science, National Center for Research on Forensic Epidemiology. Principal Investigator.  
2011-2013 World Health Organization – research grant for Rwandan study of relationship between genocide and suicide and homicide victimization and offending. \$50,000. Project No: AFRWA 1005685, Award No: 53975.  
2010-2015 Centers for Disease Control (Administered by National University of Rwanda and OHSU) SPH/CDC \$200,000 over 4 years.  
2002-2003 National Institute of Child Health and Human Development – Blue Ribbon Task Force on Roller Coaster Associated Brain Injury. \$75,000.

**DISSERTATION SUPERVISION:**

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Frank Franklin Ph.D., J.D. (2013), Earle Mack School of Law, Drexel University

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Dimitrios Papadakis BSc, MRes, Dr.rer.nat. (2012-2015) independent mentoring

Wendy Leith MS – MPH (2015) Department of Public Health & Preventive Medicine, Oregon Health & Science University School of Medicine

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Peter Harmer PhD – MPH (2006) Department of Public Health & Preventive Medicine, Oregon Health & Science University School of Medicine

## PUBLICATIONS:

### Peer-reviewed journal articles

1. Strömmer EMF, Leith WM, Zeegers MP, **Freeman MD**. Injuries due to police use of force in the United States, 2006-2015: Trends in severity and by race. *J Racial Ethn Health Disparities*. 2023 <https://doi.org/10.1007/s40615-023-01733-z>
2. **Freeman MD**, Strömmer EMF, Leith WM, Zeegers MP. Response to “Scrutinizing the causal link between excited delirium syndrome and restraint – A commentary on: ‘The role of restraint in fatal excited delirium: a research synthesis and pooled analysis’ by E.M.F. Strömmer, W. Leith, M.P. Zeegers and M.D. Freeman.” *For Sci Med Path* 2023 <https://doi.org/10.1007/s12024-023-00616-3>.
3. Leith WM, Zeegers MP, **Freeman MD**. A predictive model for perinatal hypoxic ischemic encephalopathy using linked maternal and neonatal hospital data. *J Clin Epi* (in press).
4. **Freeman MD**, Mittner BS. Prone Restraint and Excited Delirium; policy recommendations to reduce preventable deaths in police custody. *J Forensic Leg Med* (in press)
5. Kaale BR, McArthur TJ, Barbarosa MH, **Freeman MD**. Post-traumatic atlanto-axial instability: A combined clinical and radiological approach for the diagnosis of pathological rotational movement in the upper cervical spine. *J Clin Med* 2023, 12, 1469. <https://doi.org/10.3390/1469>.

6. Katz E, Katz S, **Freeman MD**. Non-surgical management of upper cervical instability via improved cervical lordosis: a case series. *J Clin Med* 2023, 12, 1797. <https://doi.org/10.3390/jcm12051797>
7. **Freeman MD**, Strömmer EMF. re: Dror and Kukucka, Linear Sequential Unmasking–Expanded (LSU-E): A general approach for improving decision making as well as minimizing noise and bias. *For Sci Int Syn* 2021 <https://doi.org/10.1016/j.fsisyn.2021.10.019>.
8. **Freeman MD**. Principles and methods for evidence-based quantification of the effect of seatbelt non-use in crash-related litigation. *Int J Environ Res Public Health* 2021;18,9455. <https://doi.org/10.3390/18189455>.
9. Dianita Ika Melia P, Zeegers MP, Herkutanto H, **Freeman MD**. Medicolegal causation investigation of bacterial endocarditis associated with an oral surgery practice using the INFERENCE approach. *Int J Environ Res Public Health* 2021;18,7530. <https://doi.org/10.3390/ijerph18147530>.
10. Nolet PS, Nordhoff L, Kristman KL, Croft AC, Zeegers MP, **Freeman MD**. Is acceleration a valid proxy for injury risk in minimal damage traffic crashes? A comparative review of volunteer, ADL and real-world studies. *Int J Environ Res Public Health* 2021;18:2901; <https://doi.org/10.3390/ijerph18062901>.
11. Dianita Ika Melia P, Zeegers MP, Herkutanto H, **Freeman MD**. Development of the INFERENCE (INtegration of Forensic Epidemiology and the Rigorous Evaluation of Causation Elements) approach to causal inference in forensic medicine. *Int J Environ Res Public Health* 2020;17:8353; doi:10.3390/ijerph17228353.
12. Strömmer EMF, Leith WM, Zeegers MP, **Freeman MD**. The role of restraint in fatal excited delirium: a research synthesis and analysis of the literature. *For Sci Med Path* 2020: doi.org/10.1007/s12024-020-00291-8.
13. **Freeman MD**. Forensic epidemiologic analysis of the cause of an unexpected teen suicide following ingestion of mis-dispensed isosorbide mononitrate. *For Sci Int Rep* 2020: doi.org/10.1016/j.fsir.2020.100093
14. Tønner G, **Freeman MD**, Rubenstein S. De waarde van chiropractie bij lagerugklachten. *Huisarts Wet* [Dutch Journal of General Practice Medicine] 2020;10.1007/s12445-020-0964-3.
15. Dianita Ika Melia P, Herkutanto H, Atmadja DS, Cordner S, Eriksson A, Kubat B, Kumar A, Payne-James J, Rubanzana W, Uhrenholt L, **Freeman MD**, Zeegers MP. The PERFORM-P (Principles of Evidence-based Reporting in FORensic Medicine-Pathology version) Guideline. *Forensic Sci Int Volume* 2021: 10.1016/j.forsciint.2021.110962.
16. Dianita Ika Melia P, **Freeman MD**, Herkutanto H, Zeegers MP. A review of causal inference in forensic medicine. *For Sci Med Path* 2020:doi.org/10.1007/s12024-020-00220-9.
17. **Freeman MD**, Katz EA, Rosa SL, Gatterman BD, Strömmer EMF, Leith WM. Diagnostic accuracy of videofluoroscopy for symptomatic cervical spine injury following whiplash trauma. *Int J Environ Res Public Health* 2020;17:1693 ; doi:10.3390/ijerph17051693
18. Centeno C, Cartier C, Stemper I, Dodson E, **Freeman MD**, Azuik U, Williams C, Hyzy M, Silva O, Steinmetz N. The treatment of bone marrow lesions associated with advanced knee osteoarthritis: comparing intra-osseous and intra-articular injections with bone marrow concentrate and platelet-rich plasma. *Pain Physician* 2021;24(3):E279-88
19. Nolet P, Emery P, Kristman E, Zeegers M, **Freeman MD**. Exposure to a motor vehicle collision and the risk of future back pain: a systematic review and meta-analysis. *Accid Analysis Prev* 2020:doi.org/10.1016/j.aap.2020.105546.

20. Uhrenholt L, Thomsen CK, Boel LWT, Hansen K, **Freeman MD**. The relationship between head and neck injuries and helmet use in fatal motorcycle and moped crashes. *Scand J For Sci* 2020;26(1):1-7.
21. **Freeman MD**, Leith WM. Estimating the number of traffic crash-related cervical spine injuries in the United States; an analysis and comparison of national crash and hospital data. *Accident Analysis and Prevention* 2020: doi:<https://doi.org/10.1016/j.aap.2020.105571>.
22. Nolet P, Emery P, Kristman E, Zeegers M. **Freeman MD**. Exposure to a motor vehicle collision and the risk of future neck pain: a systematic review and meta-analysis. *PM R* 2019 Apr 25. doi: 10.1002/pmrj.12173.
23. **Freeman MD**. Medicolegal investigation of *Vibrio parahaemolyticus*-related foodborne illness as the cause of Guillain-Barré Syndrome. *Forensic Science International: Reports* 2019;doi.org/10.1016/j.fsir.2019.100004.
24. **Freeman MD**. Concussion risk from helmeted sports; A reexamination of data and methods. *J Forensic Biomed* 2018;9:139. doi:10.4172/2090-2697.1000139.
25. Centeno C, Markle J, Dodson E, Stemper I, Hyzy M, Williams C, Ichim T, **Freeman MD**. Symptomatic anterior cruciate ligament tears treated with percutaneous injection of autologous bone marrow concentrate: a non-controlled registry study *J Translational Med* 2018;16:246 <https://doi.org/10.1186/s12967-018-1623-3>.
26. Dianita Ika Melia P, **Freeman MD**, Herkutanto H, Zeegers MP. A review of the diversity in taxonomy, definitions, scope, and roles in forensic medicine: Implications for evidence-based practice. *For Sci Med Path* 2018;14(4):460-8.
27. Rubanzana W, Hedt-Gauthier BL, Ntaganira J, **Freeman MD**. Exposure to genocide as a risk factor for homicide perpetration in Rwanda: A population-based case-control study. *J Interpers Violence* 2018;33(12):1855-70.
28. Centeno C, Markle J, Dodson E, Stemper I, Hyzy M, Williams C, **Freeman MD**. A specific protocol of autologous bone marrow concentrate and platelet products versus exercise therapy for symptomatic knee osteoarthritis: a randomized controlled trial. *J Translational Med* 2018;16:355 <https://doi.org/10.1186/s12967-018-1736-8>.
29. **Freeman MD**, Leith WM. The epidemiology of tire failure-related traffic crashes. SAE Technical Paper 2018-01-5031, 2018, doi:10.4271/2018-01-5031.
30. **Freeman MD**. A practicable and systematic approach to medicolegal causation. *Orthopedics* 2018;41(2):70-2.
31. Centeno C, Markle J, Dodson E, Stemper I, Hyzy M, Williams C, **Freeman MD**. The safety and efficacy of using lumbar epidural injection of platelet lysate for treatment of radicular pain. *J Exp Orthopaedics* 2017;4:38.
32. Centeno C, Markle J, Dodson E, Stemper I, Williams C, Hyzy M, Ichim T, **Freeman MD**. Treatment of lumbar degenerative disc disease-associated radicular pain with culture-expanded autologous mesenchymal stem cells *J Translational Medicine* 2017;15:197.
33. Williams KE. **Freeman MD**. The role of the medical examiner/ coroner system in creating a public database for surveillance and information sharing on drug overdose deaths. *Academic Forensic Pathology*. 2017;7(1):60-72.
34. Leith W, Lambert W, Boehnlein J, **Freeman MD**. The association between gabapentin and suicidality in bipolar patients. *Int Clin Psychopharm* 2018 doi:10.1097/YIC.000000000000242.



35. Centeno C, Markle J, Dodson E, Stemper I, Williams C, Hyzy M, **Freeman MD**. Symptomatic anterior cruciate ligament tears treated with percutaneous injection of autologous bone marrow concentrate: a non-controlled prospective registry study. *BMC Musculoskeletal Disorders* (in press).
36. **Freeman MD**, Goodyear S, Leith W. Risk factors for neonatal brachial plexus injury; a multistate epidemiologic study of matched maternal and newborn discharge records. *Int J Gynecology & Obstetrics* 2017;136(3):331-336.
37. **Freeman MD, Zeegers M**. Forensic Epidemiology: An evidence-based system for analyzing individual causation in a medicolegal setting. *Austin J Public Health Epidemiol* 3(3):2016. ISSN: 2381-9014.
38. Westergren H, Larson L, Carlsson A, Joud A, **Freeman MD**, Malmstrom E-M. Sex-based differences in chronic pain distribution in a cohort of patients with post-traumatic neck pain. *Disabil Rehabil* 2017 DOI: 10.1080/09638288.2017.1280543
39. Nyström A, **Freeman MD**. Central sensitization is modulated following trigger point anesthetization in patients with chronic pain following whiplash trauma. A double-blind, placebo-controlled, cross-over study. *Pain Med* 2017;0:1-6.
40. **Freeman MD**, Zeegers M. Principles and applications of forensic epidemiology in the medicolegal setting. *Law, Probability, & Risk* 2015; doi:10.1093/lpr/mgv010.
41. Centeno CJ, Al-Sayegh H, **Freeman MD** et al. A multi-center analysis of adverse events among 2,372 adult patients undergoing adult autologous stem cell therapy for orthopedic conditions. *International Orthopedics* DOI 10.1007/s00264-016-3162-y.
42. **Freeman MD**. Medicolegal causation analysis of a lumbar spine fracture following a low speed rear impact traffic crash. *J Case Rep Prac* 2015; 3(2): 23-29.
43. Uhrenholt L, **Freeman MD**, Webb A, Pedersen M, Thorup-Boel LW. Fatal subarachnoid hemorrhage associated with internal carotid artery dissection resulting from whiplash trauma. *Forens Sci Med Path* 2015;11(4):564-9.
44. Centeno CJ, Al-Sayegh H, Bashir J, **Freeman MD**. A prospective study of the safety and efficacy of autologous bone marrow concentrate for the treatment of rotator cuff tears and shoulder osteoarthritis *J Pain Res* 2015;8:1-8.
45. Centeno CJ, Al-Sayegh H, Bashir J, **Freeman MD**. A dose response analysis of bone marrow concentrate injections for knee osteoarthritis. *BMC Musculoskeletal Disorders (Section: Orthopedics and biomechanics)* 2015;16:258. doi: 10.1186/s12891-015-0714-z.
46. Rubanzana W, Ntanganira J, **Freeman MD**, Hedt-Gauthier B, Risk factors for homicide victimization in post-genocide Rwanda: a population -based case- control study. *BMC Public Health* 2015;15(1):809.
47. Rubanzana W, Hedt-Gauthier B, Ntanganira J, **Freeman MD**. Exposure to genocide as a risk factor for suicide in Rwanda. *J Epidemiol Community Health* 2015 Feb;69(2):117-22.
48. Westergren H, **Freeman MD**, Malmström E-M. The whiplash enigma: still searching for answers. *Scand J Pain* 2014; <http://dx.doi.org/10.1016/j.sjpain.2014.08.003>.
49. Centeno CJ, Pitts J, Al-Sayegh H, **Freeman MD**. Efficacy and Safety of Bone Marrow Concentrate for Osteoarthritis of the Hip; Treatment Registry Results for 196 Patients. *J Stem Cell Res Ther* 2014;4:242. doi: 10.4172/2157-7633.1000242
50. Centeno CJ, Pitts J, Al-Sayegh H, **Freeman MD**. Efficacy of autologous bone marrow concentrate for knee osteoarthritis with and without adipose graft. *Biomed Res Int* 2014. doi:10.1155/2014/370621

51. Centeno CJ, Pitts J, Al-Sayegh H, **Freeman MD**. Anterior cruciate ligament tears treated with percutaneous injection of autologous bone marrow nucleated cells; a pilot study. *J Pain Res* 2015;8:1–11.
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44. **Freeman MD**, Centeno CJ. Etiologic and demographic characteristics of traffic crash-related disc injuries. *Spine J* doi:10.1016/j.spinee.2008.06.373.
45. **Freeman MD**. Bayesian analysis of predictive characteristics in suicidal versus homicidal hanging deaths: A case study in forensic epidemiology. *Proceedings of 59<sup>th</sup> Annual Meeting of the American Academy of Forensic Sciences* February 19-24, 2007, San Antonio, Texas 2007;13:304.
46. **Freeman MD**. Probability and pathological findings in suicide versus homicidal hanging deaths; a case study. *Proceedings of 16<sup>th</sup> Nordic Conference on Forensic Medicine* June 15-17, 2006, Turku, Finland 2006:15-6.
47. **Freeman MD**. Injury Pattern Analysis as a means of driver determination in a vehicular homicide investigation. *Proceedings of 16<sup>th</sup> Nordic Conference on Forensic Medicine* Turku, Finland June 15-17 2006:38-9.
48. **Freeman MD**. Injury Pattern Analysis in Fatal Traffic Crash Investigation. *Proceedings of 57<sup>th</sup> Annual Meeting of American Academy of Forensic Sciences* New Orleans, Louisiana. February 24, 2005.
49. **Freeman MD**, Croft AC, Centeno C. Fatal head injury cases in a rural Oregon county. *Proceedings of the 19th World Congress of the International Traffic Medicine Association* Budapest, Hungary, September 14-17, 2003.
50. Croft AC, Haneline MT, **Freeman MD**. Differential Occupant Kinematics and Forces Between Frontal and Rear Automobile Impacts at Low Speed: Evidence for a Differential Injury Risk, *International Research Council on the Biomechanics of Impact (IRCOBI)* Munich, Germany September 18-20, 2002:365-6.
51. Sparr L, **Freeman MD**. The Uses and Abuses of Psychiatric IMEs: An Ethical Dilemma? *American Psychiatric Association Annual Meeting* San Francisco, California May 2003.



52. Croft AC, Haneline MT, **Freeman MD**. Low speed frontal crashes and low speed rear crashes: is there a differential risk for injury? *Proceedings of the 46th Association for the Advancement of Automotive Medicine (AAAM) Annual Scientific Conference* Tempe, Arizona, September 29-October 2, 2002:79-91.
53. Croft AC, Lord S, **Freeman MD**. Whiplash Injury: Mechanisms of Injury, Pathophysiology, and Treatment *10th World Congress on Pain, International Association for the Study of Pain* San Diego, August 17-22, 2002:482.
54. **Freeman MD**, Centeno C, Croft AC, Nicodemus CN: Significant spinal injury resulting from low-level accelerations: a comparison with whiplash. *International Congress on Whiplash-Associated Disorders* Berne, Switzerland, March 9-10, 2001.
55. Croft AC, Haneline MT, **Freeman MD**. Differential occupant kinematics and head linear acceleration between frontal and rear automobile impacts at low speed: evidence for a differential injury risk. *International Congress on Whiplash-Associated Disorders* Berne, Switzerland, March 9-10, 2001.
56. Croft AC, Haneline MT, **Freeman MD**. Automobile crash reconstruction in low speed rear impact crashes utilizing a momentum, energy, and restitution (MER) method. *International Congress on Whiplash-Associated Disorders* Berne, Switzerland, March 9-10, 2001.
57. Centeno C, **Freeman MD**, Croft AC. A comparison of the functional profile of an international cohort of whiplash injured patients and non-patients: an internet study. *International Congress on Whiplash-Associated Disorders* Berne, Switzerland, March 9-10, 2001.
58. **Freeman MD**, Sapir D, Boutselis A, Gorup J, Tuckman G, Croft AC, Centeno C, Phillips A. Whiplash injury and occult vertebral fracture: a case series of bone SPECT imaging of patients with persisting spine pain following a motor vehicle crash. *Cervical Spine Research Society 29<sup>th</sup> Annual Meeting* Monterey, CA, Nov 29-Dec 1, 2001.
59. Johansson BH, **Freeman MD**. The prevalence of symptomatic cervical disc herniation in the Swedish population with asymptomatic degenerative disc disease (a cross-sectional study). *International Congress on Whiplash Associated Disorders* March, 2001. Berne, Switzerland.
60. **Freeman MD**, Centeno C, Croft AC, Nicodemus C. Significant spinal injuries resulting from low-level accelerations: a case series of roller coaster injuries. *Proceedings of Cervical Spine Research Society 28<sup>th</sup> Annual Meeting*, November 30-December 2, 2000:110-1.
61. Croft AC, **Freeman MD**. An evaluation of the neck injury criterion; recommendations for future consideration. *Association for the Advancement of Automotive Medicine*, San Antonio, TX October, 2000.
62. **Freeman MD**, Croft AC, Rossignol AM. The prevalence of whiplash-associated chronic cervical pain among a random sample of patients with chronic spine pain. *Proceedings of 27<sup>th</sup> Annual Cervical Spine Research Society Annual Meeting*. Seattle, WA December 13-15, 1999.
63. **Freeman MD**, Croft AC, Rossignol AM. Late whiplash risk factor analysis of a random sample of patients with chronic spine pain. *World Whiplash Associated Disorders Congress*, February 8-10, 1999, Vancouver, British Columbia

#### Scientific Letters

1. Nystrom NA, **Freeman MD**. Authors' Response. *Pain Med* 2018;19(4):816-7.
2. Uhrenholt L, Webb A, **Freeman MD**. Letter to the Editor regarding "Do X-ray-occult fractures play a role in chronic pain following a whiplash injury?" *Eur Spine J* DOI 10.1007/s00586-014-3362-3.



3. **Freeman MD**, Centeno CJ, Katz E. MR imaging of whiplash injury in the upper cervical spine; controversy or confounding? *Spine J* 2009 Sep;9(9):789-90. Epub 2009 Jun 17
4. Centeno CJ, **Freeman M**. Re: Are smooth pursuit eye movements altered in chronic whiplash-associated disorders? A cross-sectional study. *Clin Rehabil* 2008 Apr;22(4):377-8.
5. Centeno CJ, **Freeman MD**. Editorial Submission on Kongsted, A., et al., Are smooth pursuit eye movements altered in chronic whiplash associated disorders? A cross-sectional study. *Clin Rehabil* 2007;21(11):1038-49.
6. **Freeman MD**. Crash Test Dummy? *New Scientist* June 23, 2007:22-3.
7. **Freeman MD**, Centeno CJ, Merskey H, Teasell R, Rossignol AM. Greater injury leads to more treatment for whiplash: no surprises here. *Arch Int Med* 2006;166(11):1238-9.
8. Centeno C, **Freeman MD**. Alberta rodeo riders do not develop late whiplash. *J Rheumatol* 2007 Feb;34(2):451-2.
9. **Freeman MD**, Centeno C. Alar, Transverse and Apical Ligament Strain due to Head-Turned Rear Impact. *Spine* 2006;31(17):2030.
10. **Freeman MD**. Cervical disc herniation following motor vehicle crash trauma. Invited commentary. *Spine J* 2005 Nov-Dec;5(6):644.
11. **Freeman MD**, Centeno C. Whiplash and Peer Review *JWRD* 2003;2(2):1-3.
12. **Freeman MD**, Centeno C. Whiplash and Secondary Gain *JWRD* 2003;2(1):1-4.
13. **Freeman MD**, Centeno C. "Placebo" Collisions and Whiplash *JWRD* 2002;1(2):1-8.
14. **Freeman MD**. Biomechanics of minor automobile accidents. *J South Orthop Assoc* 2001 Summer;10(2):95-6.
15. **Freeman MD**. Are demolition derby drivers a valid proxy for the population at risk for whiplash injury? *Arch Neurol* 2001 Apr;58(4):680-1.
16. **Freeman MD**, Rossignol AM. Effect of eliminating compensation for pain and suffering on the outcome of insurance claims. *NEJM* 2000 Oct 12;343 (15):1118-9.
17. **Freeman MD**. Letter to the editor. *Cranio* 1999;17(3):160-1.
18. Croft AC, **Freeman MD**. Commentary on "Pain after whiplash: a prospective controlled inception cohort study." *The Back Letter* 1999;14(4):43-5.
19. **Freeman MD**, Croft AC. Late Whiplash Syndrome, 3<sup>rd</sup> reply. *Lancet* 1996 Jul 13;348(9020):125.

#### **NATIONAL PRACTICE STANDARDS:**

American National Standards Institute (ANSI)/ American Standards Board (ASB) Standard 125-2021: Organizational and Foundational Standard for Medicolegal Death Investigation (Committee vice chair and co-author).

#### **MEDIA:**

June 3, 2023. – St. Denis J. <https://thetyee.ca/News/2023/06/02/Despite-Inquest-Evidence-Police-Use-Force-VPD-Stands-Ground/>

April 17, 2023 – Lindsay B. Canadian coroners starting to reject excited delirium as cause of police-related deaths. *Canadian Broadcast Corporation*.

May 14, 2022 - Hollingsworth H. From 'crisis to death': probing teen's last, desperate hours. *The Associated Press*.

February 12, 2022 - Mannix, A. Minneapolis Police Department still teaching controversial 'excited delirium' syndrome — despite claiming it had stopped. *Minneapolis Star Tribune*.

January 2, 2022 - Wiggins, O. Review of cases under former Maryland medical examiner expected to get underway this year. *Washington Post*.

October 2, 2021 - Dewan, S. Subduing suspects face down isn't fatal, research has said. Now the research is on trial. *The New York Times*.

September 20, 2021 - Sernoffsky, E. 'Excited delirium' denounced long before controversial Antioch in-custody death. *FOX 2 KTVU*.

July 13, 2021 - Porter, C and Lopez, O. Haitians hope president's funeral is a moment of unity. *The New York Times*.

July 12, 2021 - Porter, C and Lopez O. Haitian officials say U.S.-based suspect in president's killing was seeking power. *The New York Times*.

April 11, 2021. Laughland, O. 'Excited delirium': the controversial defense that could be used in the Chauvin trial. *The Guardian*.

April 19, 2021 - Karnowski, S. EXPLAINER: Why 'excited delirium' came up at Chauvin trial? *The Associated Press*.

November 15, 2020 - Lyden, T. Excited Delirium dilemma: Explanation or excuse for in-custody deaths? *FOX 9 KMSP*.

August 25, 2020 - Cushing, T. Law enforcement training: People saying 'I can't breathe' are just suffering from 'Excited Delirium.' *TechDirt*.

June 8, 2020 - Koerth M. The two autopsies of George Floyd aren't as different as they seem. *FiveThirtyEight*.

#### **SCIENTIFIC PRESENTATIONS and INVITED LECTURES:**

1. Forensic epidemiology and causation in forensic medicine: methods for evidence-based practice in cause of death investigation. British Association in Forensic Medicine, Summer Meeting 2023, Harrogate, UK. June 23-24, 2023.
2. Domains of research integrity in forensic medicine. British Association in Forensic Medicine, Summer Meeting 2023, Harrogate, UK. June 23-24, 2023.
3. Research integrity in forensic medicine; do we have a problem? Faculty of Forensic and Legal Medicine, 16<sup>th</sup> Annual Conference 2023. York, UK. May 13, 2023
4. Forensic epidemiology and death investigation in Forensic Medicine: Methods for Evidence-Based Practice. Core course lecture, Diploma of Forensic Medical Sciences curriculum, Academy of Forensic Medical Sciences, London. November 12, 2022.
5. Forensic epidemiology and death investigation in Forensic Medicine: Methods for Evidence-Based Practice. "Dying to meet you," 40<sup>th</sup> Anniversary Conference of the Dutch Forensic Medical Society, September 15-16, 2022, Rotterdam, NL.
6. Forensic Epidemiology: Advances in Methods and Applications. Department of

- Epidemiology, Care and Primary Health Research Institute, Faculty of Health, Medicine, and Life Sciences, Maastricht University, Maastricht, NL, May 24, 2022.
7. Forensic Epidemiology and Causation in Forensic Medicine: Methods for Evidence-Based Practice. Faculty of Forensic and Legal Medicine, 15<sup>th</sup> Annual Conference 2022. Royal College of Pathologists, Aldgate, London UK. May 7, 2022
8. Introduction to Forensic Epidemiology. Core course lecture, Diploma of Forensic Medical Sciences curriculum, Academy of Forensic Medical Sciences, London. November 12, 2021.
9. Introduction to Forensic Epidemiology: An evidence-based approach to causal analysis in forensic medicine. Faculty of Forensic and Legal Medicine, Royal College of Physicians, London. October 13, 2021.
10. Forensic Epidemiology: The use of population-based data and methods in the evaluation of specific causation in a medicolegal setting. American College of Epidemiology, Plenary lecture. September 10, 2021.
11. The role of epidemiology in evidence-based investigation of injury and death. 1<sup>st</sup> International Forensic Science e-Conference. National Forensic Sciences University, India. July 10-11, 2021.
12. Medico-legal causation in auto litigation. International Orthopedic Foundation. January 30, 2021.
13. Medico-legal investigation of suicide. Lecture at Mental Illness Research Education Clinical, Centers of Excellence NW (MIRECC CoE), Veteran's Affairs Medical Center, Portland Oregon. December 16, 2020.
14. The role of epidemiology in evidence-based forensic medical investigation of death and injury. Faculty of Medicine, Universitas Indonesia. December 15, 2020.
15. Does Excited Delirium cause death, or does death cause Excited Delirium? A systematic review and statistical analysis of the world literature. Presented at *Deaths in Custody 3: Judicial Considerations*. Department of Pathology and Laboratory Medicine, of the Faculty of Medicine, in conjunction with the Office of the Chief Medical Examiner, Washington DC, September 27, 2020.
16. Medico-legal investigation of suicide. Grand Rounds in Psychiatry, Department of Psychiatry, Oregon Health & Science University School of Medicine. March 24, 2020.
17. Forensic investigation of unexplained death. University of Business, Technology, and Science (UBT), October 9, 2018: Pristina, Kosovo.
18. Causation analysis in medical negligence. Radboud Summer School. Radboud Medical Center, August 14, 2018: Nijmegen, Netherlands.
19. Injury causation analysis. Radboud Summer School. Radboud Medical Center, August 14, 2018: Nijmegen, Netherlands.
20. Criminal applications of Forensic Epidemiology. Radboud Summer School. Radboud Medical Center, August 14, 2018: Nijmegen, Netherlands.
21. Introduction to Forensic Epidemiology. Radboud Summer School. Radboud Medical Center, August 13, 2018: Nijmegen, Netherlands.
22. Ballistic analysis of an attempted murder using a porcine model. *Proceedings of 70<sup>th</sup> Annual Meeting of the American Academy of Forensic Sciences* 2018 Feb 19-23: Seattle, WA.
23. Evidence-based practice in Forensic Medicine; Principles of Forensic Epidemiology. Radboud Medical Center, October 9, 2017: Nijmegen, Netherlands.
24. Incidence and risk factors for neonatal falls US Hospitals, 2003-2012. *Health Science Research*, Doernbecher Childrens' Hospital, Oregon Health & Science University, March 13, 2017, Portland, Oregon.

25. Incidence and risk factors for neonatal falls US Hospitals, 2003-2012. *Research in Progress*, Department of Internal Medicine, Oregon Health & Science University School of Medicine, January 31, 2017, Portland, Oregon.
26. Evidence-based practice in Forensic Medicine. Invited presentation to the Dutch National Forensic Institute (NFI). December 6, 2016 Maastricht University, Maastricht, Netherlands.
27. Forensic Epidemiology: Principals & Practice Part 2: Investigation of specific causation. Gran Sesión de Epidemiología Forense. November 18, 2016 Universidad Libre, Cali, Colombia.
28. Forensic Epidemiology: Principals & Practice Part 1: Investigation of specific causation. Gran Sesión de Epidemiología Forense. November 18, 2016 Universidad Libre, Cali, Colombia.
29. Fatal crash investigation. World Reconstruction Exposition (WREX 2016). May 2-6, 2016. Orlando, Florida.
30. Trends in police use-of-force related hospitalizations; an analysis of Nationwide Inpatient Sample data for 1998-2012. *Research in Progress*, Department of Internal Medicine, Oregon Health & Science University School of Medicine, November 10, 2015, Portland, Oregon.
31. Concussion risk associated with head impact; an analysis of pooled data from helmeted sports. *12<sup>th</sup> Annual Conference of the North American Brain Injury Society*, April 29-May 1, 2015 San Antonio, Texas
32. The role of risk in assessing cause in forensic investigation of injury and death. *American Medical Response biennial EMS training*. April 17, 2015, Mt. Hood, Oregon.
33. Development of a pediatric fatal head trauma registry. *Research in Progress*, Department of Internal Medicine, Oregon Health & Science University School of Medicine, April 7, 2015, Portland, Oregon.
34. Fatal crash investigation: methods and case presentations. Washington County CART Team training lecture. Tualatin Police Department, Tualatin, Oregon. March 4, 2015.
35. An analysis of the causal relationship between maternal/ prenatal cocaine use and stillbirth: results of a national hospital database study. *67<sup>th</sup> Annual Meeting of the American Academy of Forensic Sciences* 2015 Feb 16-21: Orlando, FL
36. Biomechanical, Mechanical, and Epidemiologic Characteristics of Low Speed Rear Impact Collisions. *67<sup>th</sup> Annual Meeting of the American Academy of Forensic Sciences* 2015 Feb 16-21: Orlando, FL.
37. Sexual abuse in the Boy Scouts: a preliminary analysis of Boy Scout ineligible volunteer files from 1945 to 2004. *Research in Progress*, Department of Sociology, Portland State University. December 18, 2014.
38. Understanding chronic pain after whiplash trauma. *Lund University Hospital, Department of Rehabilitation Medicine*. December 11, 2014, Lund, Sweden.
39. Forensic Applications of Epidemiology in Criminal and Civil Settings. *Richard Doll Building, Nuffield College, Oxford University*. December 10, 2014, Oxford, UK.
40. The Efficacy of tPA in Preventing Long Term Poor Outcome After Ischemic Stroke: A Reanalysis of NINDS Data. *Research in Progress*, Department of Internal Medicine, Oregon Health & Science University School of Medicine, November 25, 2014, Portland, Oregon.
41. Forensic Epidemiology and Bioterrorism. Full day course for public health and law enforcement. A joint training for public health, law enforcement, and emergency services. Sponsored by Charles County Department of Public Health and funded through a grant from the Centers for Disease Control and Prevention, Public Health Preparedness Cooperative Agreement. College of Southern Maryland. June 10, 2014. Waldorf, Maryland.

42. Maternal cocaine exposure and still-birth risk. *Research in Progress*, Department of Internal Medicine, Oregon Health & Science University School of Medicine, May 20, 2014, Portland, Oregon.
43. Forensic Applications of Epidemiology in Civil and Criminal Litigation. *9<sup>th</sup> International Conference on Forensic Inference and Statistics* August 19-22, 2014
44. Investigation of a disputed mechanism of diffuse axonal injury following a low speed frontal crash. *65<sup>th</sup> Annual Meeting of the American Academy of Forensic Sciences*, Feb 21, 2014, Seattle, Washington.
45. Public defense of dissertation for Doctor of Medicine degree, "The role of forensic epidemiology in evidence based forensic medical practice." *Section of Forensic Medicine, Department of Community Medicine and Rehabilitation, Faculty of Medicine, Umeå University*. November 6, 2013, Umeå, Sweden.
46. Case studies in applied forensic epidemiology. Invited lecture, *University of Maastricht, Department of Complex Genetics and Epidemiology*, Maastricht, The Netherlands. October 31, 2013.
47. The relationship between Chiari malformation, trauma, and chronic pain. *Karolinska Institute*, September 27, 2012, Stockholm, Sweden.
48. Serious head and neck injury as a predictor of occupant position in fatal rollover crashes. *18th Nordic Conference on Forensic Medicine*, June 13-16, 2012 Aarhus Denmark.
49. Self-defense or attempted murder? A combined ballistic and traffic crash reconstruction of a Texas shooting. *18th Nordic Conference on Forensic Medicine*, June 13-16, 2012 Aarhus Denmark.
50. Applied forensic epidemiology: the evaluation of individual causation in wrongful death cases using relative risk. *18th Nordic Conference on Forensic Medicine*, June 13-16, 2012 Aarhus Denmark.
51. Forensic Epidemiologic Investigation of Traffic Crash-Related Homicide. *Årsmøde i Dansk Selskab for Retsmedicin og Dansk Selskab for Ulykkes- og Skadeforebyggelse* [The Danish Traffic Medicine Society of the Danish Society for Forensic Medicine] November 3-5, 2011] Grenå, Denmark.
52. Traffic Crash Injuries 1960 to the present; how far we've come. Keynote address, *Årsmøde i Dansk Selskab for Retsmedicin og Dansk Selskab for Ulykkes- og Skadeforebyggelse* [The Danish Traffic Medicine Society of the Danish Society for Forensic Medicine] November 3-5, 2011] Grenå, Denmark.
53. Is there a place for forensic biomechanics in evaluation of Probability of Causation? *8th International Conference on Forensic Inference and Statistics (ICFIS)*, July 19-21, 2011; University of Washington, Seattle, Washington.
54. Case studies in forensic epidemiology. *8th International Conference on Forensic Inference and Statistics (ICFIS)*, July 19-21, 2011; University of Washington, Seattle, Washington.
55. The Error Odds method of objectively assessing bioengineering based claims of causation; a Bayesian approach to test validity quantification. Invited lecture; joint session of Jurisprudence and Engineering Sciences. *62<sup>nd</sup> Annual Meeting of the American Academy of Forensic Sciences* Feb 25, 2010, Seattle, Washington.
56. The effect of restraint use on skull vault fractures in rollover crashes. Engineering Sciences section, *62<sup>nd</sup> Annual Meeting of the American Academy of Forensic Sciences* Feb 26, 2010 Seattle, Washington.



57. Head injuries in lower speed collinear collisions; an analysis of the National Automotive Sampling System database. Engineering Sciences section, *62<sup>nd</sup> Annual Meeting of the American Academy of Forensic Sciences* Feb 26, 2010 Seattle, Washington.
58. The Error Odds assessment of accuracy for tests in forensic medicine; a simple application of Bayes' Law. Invited presentation; *XXI Congress of the International Academy of Legal Medicine* May 2009, Lisbon, Portugal
59. Forensic Epidemiology and Traumatic Brain Injury. Invited presentation; *VII World Congress on Brain Injury, International Brain Injury Association* April 2008 Lisbon, Portugal.
60. Bayesian analysis of predictive characteristics in suicidal versus homicidal hanging deaths: A case study in forensic epidemiology. *59<sup>th</sup> Annual Meeting of the American Academy of Forensic Sciences* February 19-24, 2007, San Antonio, Texas.
61. Probability and pathologic findings in suicidal versus homicidal hanging deaths; a case study *16<sup>th</sup> Nordic Conference on Forensic Medicine* June 15, 2006, Turku, Finland.
62. Pattern Analysis as a means of driver determination in a vehicular homicide investigation *16<sup>th</sup> Nordic Conference on Forensic Medicine* June 16, 2006, Turku, Finland.
63. Probability and pathologic findings in suicidal versus homicidal hangings; a case study. Grand Rounds *Institute of Forensic Medicine, Aarhus University, Aarhus, Denmark*. October 27, 2005.
64. Road Traffic Crashes- mechanisms, injuries and analysis. Invited lecture (Keynote address) *Danish Society for Automotive Medicine* Aarhus, Denmark. October 27, 2005.
65. The Defense Medical Evaluation: Issues, Ethics and Pitfalls. *2<sup>nd</sup> Annual International Whiplash Trauma Congress* Breckenridge, Colorado. February 26, 2005.
66. Injury Pattern Analysis in Fatal Traffic Crash Investigation *American Academy of Forensic Sciences' 57<sup>th</sup> Annual Meeting* New Orleans, Louisiana. February 24, 2005.
67. Independent Medical Evaluations and secondary gain. Grand Rounds, *Department of Psychiatry, Oregon Health & Science University School of Medicine* November 2, 2004.
68. The epidemiology of crash-related trauma. Invited lecture. Grand Rounds *Peace Health Hospital* Longview, Washington. March 30, 2004.
69. Injury pattern analysis: the practical application to the investigation of crash related death. Grand Rounds *Department of Pathology, Oregon Health Sciences University* Portland, Oregon. January 21, 2004.
70. Literature critique, Whiplash Updates. Invited lecture. *British Columbia Chiropractic Association* Vancouver, British Columbia, Canada. October 23, 2003.
71. Catastrophic crash cases and probability. Invited lecture. *Paris American Legal Institute* Florence, Italy. September 22, 2003.
72. Injury pattern analysis as a means of driver identification in a vehicular homicide; a case study. *International Traffic Medicine Association Annual Meeting*. Budapest, Hungary. September 17, 2003.
73. Fatal head injury crashes in a rural Oregon county, 1990-1999. *International Traffic Medicine Association Annual Meeting*. Budapest, Hungary. September 16, 2003.
74. Crash reconstruction and forensic science. Invited lecture. *CRASH 2003 Spine Research Institute of San Diego*. San Diego, California. August 22, 2003.
75. The uses and abuses of psychiatric IMEs: an ethical dilemma. *American Psychiatric Association Annual Meeting*. San Francisco, California. May 21, 2003.
76. Crash-related trauma. Invited lecture. *THRI Neuroscience meeting. Texas Back Institute* St. Mary's Hospital. Plano, Texas. February 28, 2003.



77. Whiplash injury and occult spinal fracture. *International Association for the Study of Pain* 10<sup>th</sup> World Congress on pain. San Diego, California. August 20, 2002.
78. Crash Reconstruction and forensic science. *CRASH 2002* Spine Research Institute of San Diego. San Diego, California. August 8, 2002.
79. Epidemiologic and medical aspects of whiplash injury. *Swedish Orthopedic Society* Stockholm, Sweden. May 17, 2002.
80. Epidemiologic considerations of whiplash injuries. Invited lecture. *European Chiropractic Union Annual Congress* Oslo, Norway. May 9, 2002.
81. The role of cervical manipulation in neck pain. Invited lecture. *Cervical Spine Research Society 29<sup>th</sup> Annual Meeting* Instructional Course, Monterey, CA, Nov 29-Dec 1, 2001
82. Whiplash injury and occult vertebral fracture: a case series of bone SPECT imaging of patients with persisting spine pain following a motor vehicle crash. *Cervical Spine Research Society 29<sup>th</sup> Annual Meeting* Monterey, CA, Nov 29-Dec 1, 2001
83. Interpreting the medical literature with a focus on bias and confounding/Minimal Damage Crash Reconstruction. Invited lecture. *CRASH 2001* Spine Research Institute of San Diego. San Diego, CA. August 2001.
84. Injury Pattern Analysis and Forensic Trauma Epidemiology in vehicular homicide investigation. *Washington State Patrol* Lacey, WA, June 20, 2001
85. Case studies in multidisciplinary spine care. *Chiropractic Association of Oregon* Portland OR, April 28, 2001
86. Injury Pattern Analysis and Forensic Trauma Epidemiology in vehicular homicide investigation. *Washington State Patrol* Vancouver, WA, February 13, 2001
87. The role of cervical manipulation in neck pain. Invited lecture. *Cervical Spine Research Society 28<sup>th</sup> Annual Meeting* Instructional Course. Charleston, South Carolina, December 1, 2000
88. Significant spinal injuries resulting from low-level accelerations: a case series of roller coaster injuries. *Cervical Spine Research Society 28<sup>th</sup> Annual Meeting* Charleston, South Carolina, December 1, 2000
89. Injury Pattern Analysis and Forensic Trauma Epidemiology in vehicular homicide investigation. *Medical Examiner Division, Oregon State Police*. Salem, OR. November 28, 2000
90. Minimal damage motor vehicle crash reconstruction. Invited lecture. Spine Research Institute of San Diego. *CRASH 2000* Spine Research Institute of San Diego. San Diego CA. August 11-13, 2000
91. Analysis of the whiplash literature with emphasis on research out of Quebec and Saskatchewan. *Saskatchewan Medical Group and Coalition Against No-Fault*. Saskatoon, Saskatchewan. September 2000.
92. Forensic applications of crash reconstruction. Invited lecture. *CRASH 2000* Spine Research Institute of San Diego. San Diego, CA. August 11, 2000.
93. Injury Pattern Analysis and Forensic Trauma Epidemiology; practical application in the forensic setting. Washington County CART Team training lecture, on behalf of *Medical Examiner Division, Oregon State Police*. Lake Oswego, Oregon. July 13, 2000.
94. The epidemiology of acute and chronic whiplash injury in the U.S. Invited lecture. *HWS-Distorsion (Schleudetrauma) & Leichte Traumatische, Hirnverletzung. Invaliditat und Berufliche Reintegration*. Basel, Switzerland. June 29-30, 2000.
95. Whiplash injury risk factors. Invited lecture. *Whiplash 2000*. Bath, England. May 18, 2000.
96. How many whiplash injuries could there be? Invited lecture. *Whiplash 2000* Bath, England. May 17, 2000.

97. Whiplash injury and occupant kinematics; the results of human volunteer crash testing. Invited lecture. *Society for Road Traffic Injuries (LFT)*. Oslo, Norway. April 3, 2000.
98. Epidemiology of Whiplash Injuries. Invited lecture. *Swedish Orthopedic Society* Stockholm, Sweden. March 31, 2000.
99. Methodologic pitfalls in epidemiological and clinical research, with examples from whiplash research. Invited lecture. *Arvetsinstitut (Institute for Musculoskeletal Medicine Research) Umeå University*, Umeå, Sweden. March 30, 2000.
100. The prevalence of whiplash-associated chronic cervical pain among a random sample of patients with chronic spine pain. *Cervical Spine Research Society 27<sup>th</sup> Annual Meeting* Seattle, WA December 13-15, 1999.
101. High speed videography of occupant movement during human volunteer crash testing; searching for an injury threshold. *North American Whiplash Trauma Congress* November 12, 1999.
102. Scientific Chair Address. *North American Whiplash Trauma Congress* November 12, 1999.
103. The science of whiplash injuries: common mistakes in the reconstruction of low speed crashes. Invited lecture. *Forensic Accident Reconstructionists of Oregon* Eugene, Oregon, April 1, 1999.
104. Late whiplash risk factor analysis of a random sample of patients with chronic spine pain. *Whiplash Associated Disorders World Congress* Vancouver, B.C. February 9, 1999.
105. The epidemiology of whiplash injuries; critiquing the literature. Grand rounds, *Department of Public Health and Preventive Medicine, Oregon Health Sciences University* Portland, Oregon. December 17, 1998.
106. The scientific appraisal of motor vehicle crash-related injuries. Invited lecture. *Managing the Cost of Auto Injuries*. Orlando, FL. December 8, 1998.
107. Risk factors for chronic pain following acute whiplash injury. Invited lecture. *Managing the Cost of Auto Injuries* Orlando, FL. December 7, 1998.
108. The epidemiology of whiplash injuries. Current Issues in Public Health, *Department of Public Health and Preventive Medicine, Oregon Health Sciences University* Portland, Oregon. October 7, 1998
109. The epidemiology of whiplash - is there a reliable threshold for whiplash injury? Invited lecture. *HWS-Distortion (Schleudetrauma) & Leichte Traumatische Medico-Legal Congress*. Basel, Switzerland, June 26, 1998.
110. The Epidemiology of Late Whiplash. Invited lecture. *HWS-Distortion (Schleudetrauma) & Leichte Traumatische Medico-Legal Congress*. Basel, Switzerland, June 25, 1998.
111. Methodologic error in the whiplash literature. Invited lecture. *Whiplash '96* Brussels, Belgium, November 15-16, 1996
112. Conservative therapy for spinal disorders *St. Francis Hospital*, San Francisco, CA. September 1994
113. The history of chiropractic. Invited lecture. *White Plains Hospital*, White Plains, NY. December 1993